



DEPARTMENT OF THE AIR FORCE  
59TH MEDICAL WING (AETC)  
JOINT BASE SAN ANTONIO - LACKLAND TEXAS



21 MAR 2017

MEMORANDUM FOR SGSP

ATTN: MAJ SHAOPING MO SUMNER

FROM: 59 MDW/SGVU

SUBJECT: Professional Presentation Approval

1. Your paper, entitled Assessing Medication Adherence in Patients with Rheumatoid Arthritis (RA) presented at/published to American Pharmacists Association (Journal/Abstract) & American Pharmacists Association Annual Meeting, San Francisco, CA, 24-27 March 2017 (Poster) in accordance with MDWI 41-108, has been approved and assigned local file #17154.
2. Pertinent biographic information (name of author(s), title, etc.) has been entered into our computer file. Please advise us (by phone or mail) that your presentation was given. At that time, we will need the date (month, day and year) along with the location of your presentation. It is important to update this information so that we can provide quality support for you, your department, and the Medical Center commander. This information is used to document the scholarly activities of our professional staff and students, which is an essential component of Wilford Hall Ambulatory Surgical Center (WHASC) internship and residency programs.
3. Please know that if you are a Graduate Health Sciences Education student and your department has told you they cannot fund your publication, the 59th Clinical Research Division may pay for your basic journal publishing charges (to include costs for tables and black and white photos). We cannot pay for reprints. If you are a 59 MDW staff member, we can forward your request for funds to the designated Wing POC at the Chief Scientist's Office, Ms. Alice Houy, office phone: 210-292-8029; email address: [alice.houy.civ@mail.mil](mailto:alice.houy.civ@mail.mil).
4. Congratulations, and thank you for your efforts and time. Your contributions are vital to the medical mission. We look forward to assisting you in your future publication/presentation efforts.

Linda Steel-Goodwin

LINDA STEEL-GOODWIN, Col, USAF, BSC  
Director, Clinical Investigations & Research Support



## PROCESSING OF PROFESSIONAL MEDICAL RESEARCH/TECHNICAL PUBLICATIONS/PRESENTATIONS

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# Assessing Medication Adherence in Patients with Rheumatoid Arthritis (RA)

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## BACKGROUND

- Rheumatoid Arthritis (RA) is a symmetric, erosive synovitis autoimmune disease
- There are 1-3 million Americans suffering from RA of which 70% are women
- People with RA have higher risk of developing heart disease and stroke
- Oral Disease Modifying Anti-Rheumatic Drugs (DMARDs) are the most used RA medications
- Effectiveness of DMARDs is dependent on patient medication adherence
- Medication adherence is a significant healthcare issue affecting many patients, especially those with chronic diseases and prolonged drug therapy
- Non-adherence rates to DMARDs in RA patients are reported to be up to 80% for correct dosing
- There are different methods to measure how adherent patients are to their medication regimens
- Patient questionnaires/self-reports are thought to be simple, inexpensive, and the most useful method in the clinical setting
- The Morisky Medication Adherence Scale (MMAS) was developed to assess medication adherence intent and has been validated in several common disease but not in RA
- There are several variations of the MMAS but we used the MMAS-8 which has eight questions
- The Compliance-Questionnaires-Rheumatology (CQR) is a rheumatology-specific instrument measuring patient compliance to drug regimens
- CQR identifies factors that contribute to suboptimal patient compliance and could be used to predict future compliance in patients with RA
- CQR is validated in RA but is difficult to score which limits its usefulness in the clinic setting
- The average time to complete the CQR is approximately 12 minutes, compared to less than 1 minute to complete the MMAS-8

## OBJECTIVES

- The primary objective is to determine if there is a correlation between the CQR19, CQR5, and the MMAS8
- The secondary objective is to assess if there is a potential medication adherence issue in patients with RA taking oral DMARDs

## METHODS

### DMARD drugs included in this study

- In this study, patients with RA were asked if they were currently taking one of the following oral DMARD medications: methotrexate, hydroxychloroquine (Plaquenil®), leflunomide (Arava®), sulfasalazine (Azulfidine®), and/or minocycline (Minocin®)

### Hypothesis

- There is a correlation between the CQR-19 and the MMAS-8. The research study would also estimate the extent of medication adherence in patients with RA taking oral DMARDs

### Study population

- Inclusion criteria: anyone that is 18 years and over with a diagnosis of RA, treated with an oral DMARD, treated for RA at the BAMC Rheumatology Clinic, able to read English, and has no cognitive disability

## METHODS (Cont.)

**Exclusion criteria:** Patients not meeting the inclusion criteria

**Sample Size:** An 80% power was used to detect a correlation coefficient of 0.2. Based on the validation studies for the CQR and MMAS, we estimated that between 10% and 20% of surveys will not be evaluable. The estimated sample size for this study is 102.

**Data collection methods and processing:** At the time of check-in for a routine appointment in the Rheumatology Clinic, patients were invited to participate in a survey. Patients were provided a questionnaire containing both the MMAS-8 and CQR-19. The CQR and MMAS were used to assess medication adherence, then the CQR and MMAS were compared to assess whether the shorter MMAS could be used to routinely assess medication adherence in patients taking oral DMARDs for RA. The completed surveys were collected in designated drop boxes located at the clinic front desk. At the end of each business day, the primary investigator (PI) for the study collected the completed survey forms for up to 6 weeks.

**Statistical Analysis:** The data were evaluated using descriptive statistics to describe the patient population and normality testing to determine whether we should use Pearson or Spearman correlation. Spearman correlation was used to evaluate the association between the various adherence predictor tools continuous scores. Chi-square tests were used to compare how CQR19, CQR5 and MMAS8 placed patients into adherence groups. The CQR19 places patients into low and high medication taking and dosing compliance groups; the CQR5 places patients into low or high medication adherence groups; and MMAS8 places patients into low adherence (scores < 6), medium adherence (scores of 6 or 7), and high adherence (scores of 8).

**Descriptive Statistics:** Data were collected on 56 patients, but not all patients provided complete data and analyzed using Stata version 14. The descriptive statistics are presented below.

## PRELIMINARY RESULTS

Descriptive Statistics		
Variable	Number of Observations	Statistic
Mean (SD)		
Age (total cohort)	52	54 (15.7)
Females	40	53 (15.8)
Males	12	59 (15.7)
Median (IQR)		
Number of prescription medications	48	8 (3)
Number of oral RA medications	55	2 (3)
IQR = Interquartile Range		

Before inferential testing, the variables were evaluated to ensure that the assumptions for each proposed test were met. We intended to use Pearson correlation to compare the continuous adherence predictor variables which requires that the variables be normally distributed. Since none of the CQR-19 or CQR-5 predictors were normally distributed, Spearman correlations were employed to determine the strength of association between these variables. These results are provided below.

Spearman Correlations for Adherence/Compliance Predictor Scores				
Comparison Groups	N	p (rho)	P-value	Interpretation
CQR19 Taking - CQR19 Dosing Compliance	54	0.597	<0.001	Moderate, significant, positive
CQR19 Taking Compliance - CQR5 High Adherence	54	0.289	0.031	Weak, significant, positive
CQR19 Dosing Compliance - CQR5 High Adherence	54	0.469	0.0003	Moderate, significant, positive
MMAS8 - CQR19 Taking Compliance	54	0.117	0.390	Very weak, nonsignificant, positive
MMAS8 Adherence - CQR19 Dosing Compliance	54	0.0058	0.966	Very weak, nonsignificant, negative
MMAS8 Adherence - CQR5 High Adherence	54	0.1559	0.2513	Very weak, nonsignificant, positive

## PRELIMINARY RESULTS (Cont.)

The null hypothesis for chi-square is that the groups are independent. We conducted these tests at the 0.05 level of significance. P-values less than 0.05 would indicate that the groups are not independent; there is an association between the two variables. For this study, any significant results would mean that the two adherence measures tested generally would be similar in their ability to identify patients' adherence intention. The results of the chi-square test are provided below. The only significant associations were between the two CQR-19 compliance measures and the CQR-5 adherence predictor.

Chi-Square Tests of Independence (All Adherence/Compliance Groups)			
Comparison Groups		Chi-square	P-value
CQR19 Taking Compliance	CQR5	18.589	< 0.001
CQR19 Dosing Compliance	CQR5	19.337	< 0.001
MMAS8 Adherence	CQR19 Taking Compliance	0.1505	0.698
MMAS8 Adherence	CQR19 Dosing Compliance	0.0008	0.977
MMAS8 Adherence	CQR5	0.8958	0.334

## DISCUSSION

- This is a preliminary analysis because the data collection has not been completed
- The CQR19 performance in our patient population was similar to that which was described in the validation study
- The CQR5 high adherence predictor was moderately correlated with CQR19 Dosing compliance
- The MMAS8 was very weakly correlated with both the CQR19 and CQR5
- Both the CQR19 and CQR5 were similar in their ability to place patients into adherence groups
- Neither the CQR19 nor CQR5 were similar to the MMAS8 in their ability to place patients into adherence groups

## CONCLUSION

- Based on the preliminary analysis, the MMAS8 was not able to place patients into adherence groups in a way that was similar to the CQR19, we would not recommend replacing the CQR19 with the MMAS8
- The CQR5 was able to predict adherence as well as both of the CQR19 compliance measures (taking and dosing) and could be used in the clinic setting

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